Derek LOFTY & Associates

Consulting Structural Engineers

Date: 17 October 2020

Job Number: 12150

Client: Mr & Mrs S Andrews

Project: Pitchers Barn Conversion

Report on the Existing Barn Structure

at

Pitchers Barn, Denham Farm, Bullocks Farm lane, Wheeler End, HP14 3NQ

1. Introduction

1.1. In accordance with instructions received from Mr Shaun Andrews on 1st September 2021, Derek LOFTY & Associates carried out a specific structural inspection of the barn structure of the old grain store, at Pitchers Barn, Denham Farm, Bullocks Farm lane, Wheeler End, HP14 3NQ. The purpose of this report is to confirm or otherwise report on the structural adequacy of the barn for conversion to habitable use.

1.2. The inspection was carried out on Wednesday 8th September 2021. The weather at time of survey was sunny and bright.

1.3. Comments are generally based on a single visual inspection and notes taken during a walk over survey from ground level. Whilst no intrusive investigation was deemed necessary for this exercise, a trial pit was excavated and an area of the floor slab broken out prior to our visit.

1.4. This report is limited to the structural elements of the property only and no comment is made on any part of the property which is not the subject of this report.

1.5. Where the terms “right hand” or “left hand” are used, they assume that the reader is facing the front or south elevation.

2. Background Information

2.1. The project includes the proposed conversion of a single ancillary barn structure, that was the old grain store, within the curtilage of Denham Farm and Pitchers Barn. The old grain store is generally of traditional construction, and currently utilised for domestic storage by the current owners of Pitchers Barn.

2.2. The barn subject of this investigation is situated on a mature, reasonably level plot, within the hamlet of Wheeler End, approximately 7miles west of High Wycombe town centre. The site is bounded to the north by Bullocks Farm Lane, east and south by open fields and to the west by the main dwelling house and Denham Farm. The barn building is situated within the curtilage of Pitchers Barn and is currently used for vehicle and equipment storage.

2.3. The proposals are to convert the barn for habitable use.

2.4. In order to understand the suitability of the existing structures for conversion, a walkover survey was carried out. The purpose of this report is to examine the main structural elements of the barn, commenting on the structural significance and condition together with overall suitability for conversion.

2.5. Refer to the appendix for an ariel view of the barn, Figures A1 and a structural layout A2.

3. The Existing Structures

3.1. The old grain store is an agricultural barn type building and of two styles of construction. To the left, the barn is steel framed with a curved roof and is fully clad with corrugated sheet metal cladding. To the right is a duo pitched roof, covered with corrugated sheet metal and external walls of brick and block construction. The external envelope is extensively covered by vegetation.

3.2. The left-hand and right-hand sides of the barn are used for storage, the middle section, circa 3-4m wide, comprises the old grain silos and is constructed in a facing brick off a substantial concrete base.

3.3. The steel framed element to the left-hand side is a regular arrangement of steel columns and lattice trusses. The trusses span perpendicular to the long side of the barn building. A series of steel angle section cladding rails and purlins support the external cladding.

3.4. The masonry structure to the right-hand side is a regular arrangement of facing brickwork that supports a regular arrangement of steel lattice trusses. The trusses span perpendicular to the long side of the barn building. A series of equal angle steel sections form the purlins that support the corrugated steel roofing sheets.

3.5. The main access to the barn is via two substantial sliding doors either side of the grain silos.

3.6. The internal floor of the barn is a brush-finished, concrete, ground-bearing slab.

3.7. At the time of our inspection a trial pit had been excavated to the front left-hand corner of the barn. A concrete pad foundation formed at circa 0.6m deep was recorded beneath the corner column.

3.8. A trial pit was also excavated adjacent to the right-hand masonry wall section. A concretes strip foundation, circa 450mm deep, was recorded in virgin ground.

3.9. An area of the ground bearing slab was broken out. The concrete ground-bearing slab was recorded to be circa 100-200mm thick plain concrete, constructed off a depth of a hardcore and clinker type blinding.

3.10. At the time of our inspection the barn is presented in what is considered to be fair structural condition. The ridge line is out of horizontal alignment and the roof planes undulate, however, the misalignment is not structurally significant and common place for structures of its current use and of this age and style.

3.11. The steel-clad external walls are slightly out of vertical alignment and are not particularly true to line. However, the structural integrity remains unaffected.

3.12. The masonry construction external walls remain reasonably vertical and true to line.

3.13. The concrete floor slab, although substantial, slopes gently by approximately 30mm toward the rear elevation. The slab otherwise is considered to be in sound structural condition.

4. Ground Conditions

4.1. Geological Maps indicate ground conditions to be superficial deposits of the Clay with Flints Formation, which varies significantly between clay, silt, sand and gravel. The superficial deposit overlays the more regular bedrock formation of the Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation, all of which are very generally undifferentiated chalk.

4.2. No further ground investigation has been carried out at this time; the existing barn building is substantial and although slightly misaligned, is performing adequately for its current purpose.

4.3. Whilst there are a number of mature trees in proximity of the barn building, none are considered to be within a range that might influence the foundations. Furthermore, the prevailing ground conditions in the area are not of those susceptible to volume change or influenced by the presence of trees.

5. Project Summary

5.1. The proposals are to convert the existing barn into habitable accommodation. The development will include the renewal of the external cladding with a watertight and thermally efficient system.

5.2. Similarly, the existing corrugated sheet roof will be replaced with a new, thermally efficient light weight roof panel.

5.3. The existing slab can be reused, but levelled with a grout prior to a layer of insulation and screed applied to form a raised ground floor level, 150mm above the external ground level.

5.4. The elevations will be modified to accommodate window and door apertures to suit the proposed conversion. These new apertures will be formed through non-structural elements of the external building envelope, and are therefore not presently of concern for the purpose of this report.

5.5. All the proposals will be of a light-weight construction, commensurate with the currently applied loadings.

6. Suitability of Existing Structure for Reuse

6.1. The existing roof and wall coverings cannot be retained due to the risk of thermal inefficiency. However, these are non-structural elements of the building and therefore are considered irrelevant as part of a structural appraisal.

6.2. The site investigation has established a concrete strip foundation to the external masonry walls and pad foundations to the structural columns, founded at least 0.45m below ground level in what is considered to be naturally occurring deposits.

6.3. It is therefore considered that the existing external masonry walls could be retained, upgraded to meet modern thermal requirements. The cladding will need to be replaced with a thermally efficient, lightweight stud partitioning, to keep the loadings commensurate with the existing structure. The external finishes should be lightweight, as prescribed by the architect.

6.4. The existing floor slab is substantial and can be reused; however, should be upgraded with the introduction of a damp-proof membrane and the addition of thermal insulation and screed to bring the finished floor level 150mm above external ground level.

7. Conclusion

7.1. Based on the walk over survey, together with the results of the trial pit investigation, it is considered that the existing building is substantial, structurally sound and can readily be adapted to accommodate the conversion proposals.

7.2. It is considered that the building could be readily converted without major reconstruction or demolition of any of the existing structural elements. However, the building will be subject to significant upgrading as part of the conversion process to habitable accommodation.

8. Disclaimer

8.1. This report is based on a visual inspection of the property, together with an intrusive investigation of the ground locally. This report is copyright and is restricted to the sole use and benefit of the above-named Client and shall not extend to any third party. Furthermore, this report shall not be reproduced or copied without prior written permission from Derek Lofty & Associates. This report is further restricted to the general stability of the building; no other aspect of the property was inspected and cannot therefore be considered as part of this report. Finally, this report is only valid for a period of 6 months, after which its accuracy can only be fully relied on following a full re-inspection and revision.

8.2. We also reserve the right to amend our opinions in the event of additional information being made available at some future date.

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Appendix

Photographs Etc.

Figure 1 - Aerial View of The Old Grain Store

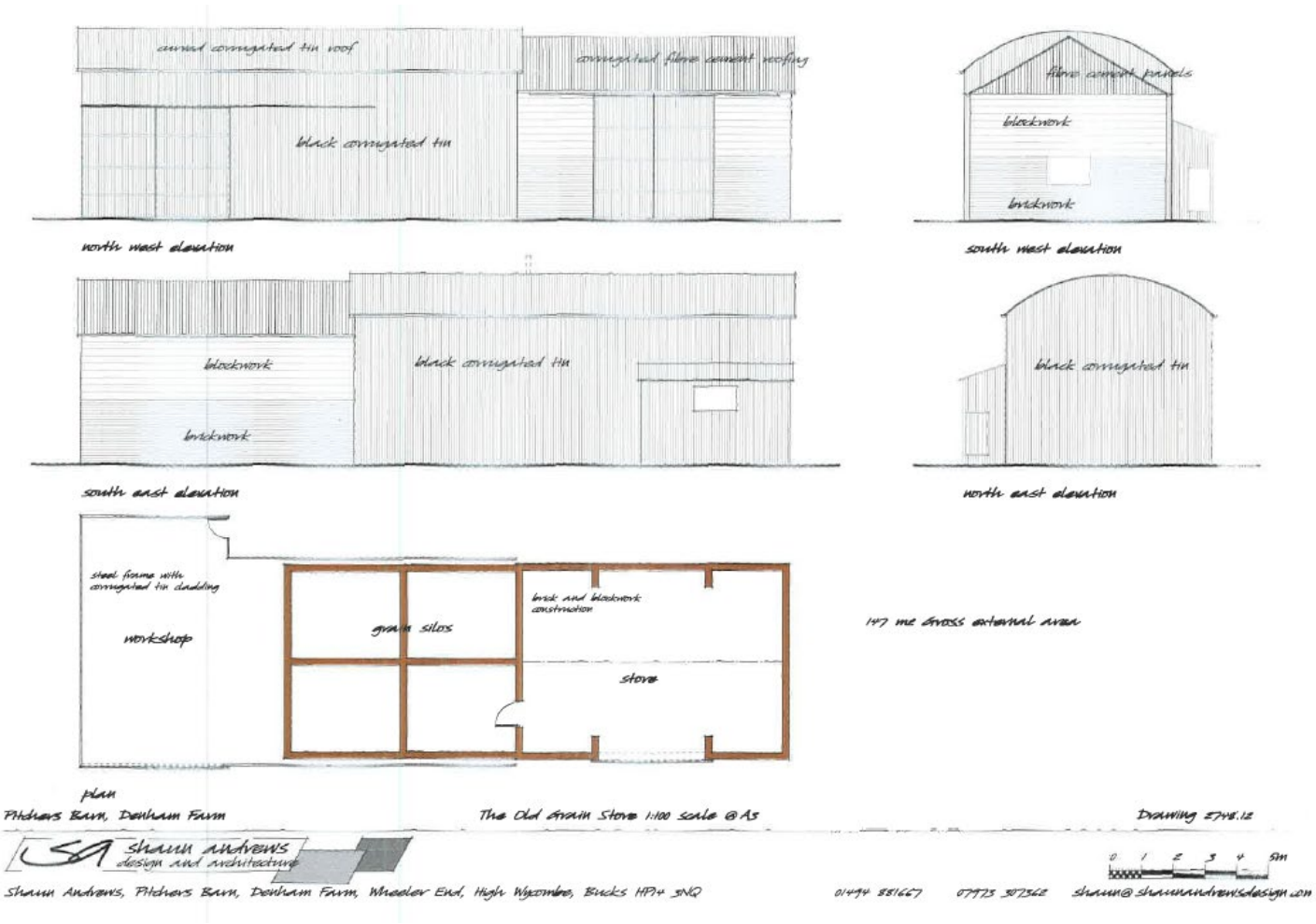

Figure 2 – Barn Layout

Figure 3 - Rear (South) Elevation

Figure 4- Internal left-hand Side

Figure 5 - Internal right-hand side elevation

Figure 6 – Front (North) Elevation